Volunteer Lake Assessment Program Individual Lake Reports

JACKMAN RESERVOIR, HILLSBOROUGH, NH

MORPHOMETRIC DATA

Watershed Area (Ac.):	44,223	**Max. Depth (m):**	9.6	**Flushing Rate (yr^{-1})**	10.6
Surface Area (Ac.):	520	**Mean Depth (m):**	4.6	**P Retention Coef:**	0.36
Shore Length (m):	11,300	**Volume (m^3):**	9,008,500	**Elevation (ft):**	770

TROPHIC CLASSIFICATION

Year	Trophic class
1988	OLIGOTROPHIC
2005	OLIGOTROPHIC

KNOWN EXOTIC SPECIES

The Waterbody Report Card tables are generated from the 2012 305(b) report on the status of N.H. waters, and are based on data collected from 2001-2011.

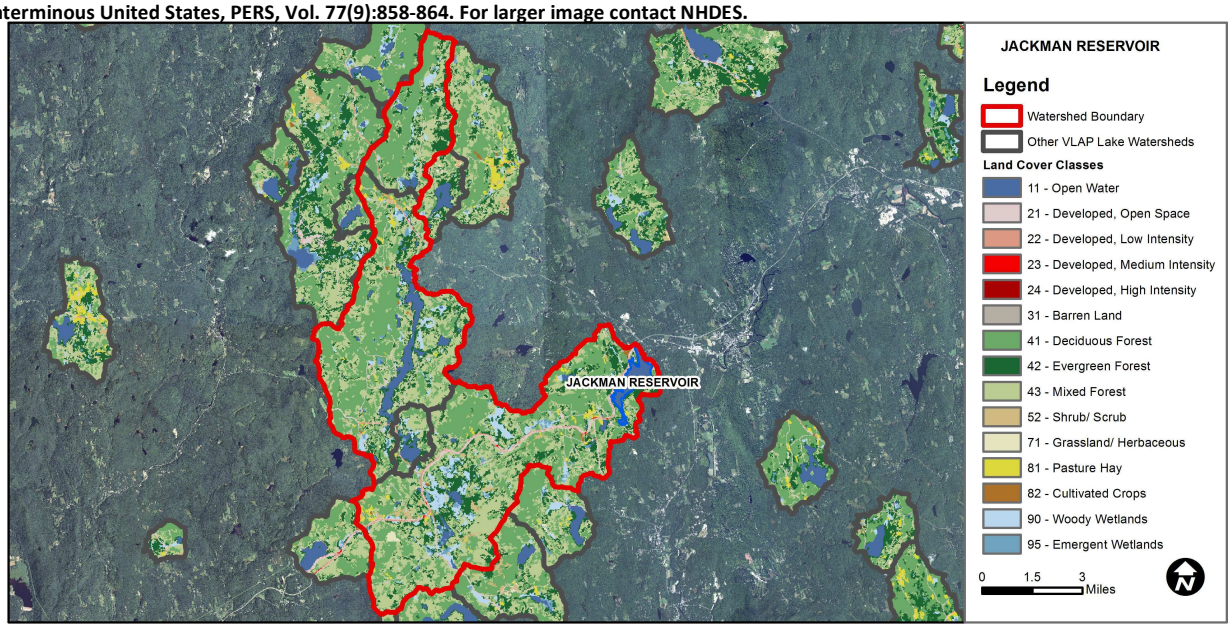
Designated Use	Parameter	Category	Comments
Aquatic Life	Phosphorus (Total)	Cautionary	<5 samples and median is > threshold. More data needed.
	pH	Slightly Bad	>10% of samples exceed criteria by a small margin (minimum of 2 exceedances).
	D.O. (mg/L)	Encouraging	< 10 samples and no exceedance of criteria. More data needed.
	D.O. (% sat)	Encouraging	< 10 samples and no exceedance of criteria. More data needed.
	Chlorophyll-a	Encouraging	<5 samples and median is < threshold. More data needed.
Primary Contact Recreation	E. coli	Encouraging	>2 samples exist that are > 75% of geometric mean criteria, but not enough samples to calculate geomertic mean. No single sample exceedances. More data needed.
	Chlorophyll-a	Encouraging	< 10 samples and no exceedance of criteria. More data needed.

BEACH PRIMARY CONTACT ASSESSMENT STATUS

JACKMAN RESERVOIR - MANAHAN PARK TOWN BEACH	E. coli	Bad	>/=1 exceedance(s) of geometric mean criterion and/or >/=2 exceedances of single sample criterion, with 1 or more >2X criteria.

WATERSHED LAND USE SUMMARY

Fry, J., Xian, G., Jin, S., Dewitz, J., Homer, C., Yang, L., Barnes, C., Herold, N., and Wickham, J., 2011. Completion of the 2006 National Land Cover Database for the Conterminous United States, PERS, Vol. 77(9):858-864. For larger image contact NHDES.



Land Cover Category	% Cover	Land Cover Category	% Cover	Land Cover Category	% Cover
Open Water	4.77	Barren Land	0.02	Grassland/Herbaceous	0.22
Developed-Open Space	3.15	Deciduous Forest	34.97	Pasture Hay	1.13
Developed-Low Intensity	0.91	Evergreen Forest	15.8	Cultivated Crops	0.16
Developed-Medium Intensity	0.04	Mixed Forest	31.84	Woody Wetlands	4.52
Developed-High Intensity	0	Shrub-Scrub	1.24	Emergent Wetlands	1.08

VOLUNTEER LAKE ASSESSMENT PROGRAM INDIVIDUAL LAKE REPORTS
FRANKLIN PIERCE LAKE (JACKMAN RESERVOIR), HILLSBOROUGH, NH
2013 DATA SUMMARY

OBSERVATIONS AND RECOMMENDATIONS (*Refer to Table 1 and Historical Deep Spot Data Graphics)*

- **CHLOROPHYLL-A:** Chlorophyll levels were elevated in August, greater than the state median, and the highest measured since monitoring began. Significant early summer storm events and above average rainfall may have contributed nutrients necessary to support the elevated algal growth later in the summer.
- **CONDUCTIVITY/CHLORIDE:** Deep spot and tributary conductivity and chloride were low and less than the state medians.
- **TOTAL PHOSPHORUS:** Epilimnetic phosphorus levels were slightly elevated and the highest measured since monitoring began, however remained below the state median. Significant early summer storm events and above average rainfall may have contributed to the epilimnetic phosphorus. North Branch phosphorus levels were average for that station.
- **TRANSPARENCY:** Transparency was the lowest measured since monitoring began and was lower than the state median likely due to the elevated algal growth.
- **TURBIDITY:** Epilimnetic turbidity was slightly above average for that station due to the elevated algal growth. Hypolimnetic and North Branch turbidity were in the average range for those stations.
- **PH:** pH levels were less than the desirable range of 6.5 to 8.0 units.
- **DISSOLVED OXYGEN:** Dissolved oxygen levels decreased in the hypolimnion but were generally high from five meters to the surface.
- **RECOMMENDED ACTIONS:** The increased algal growth and epilimnetic phosphorus may have been caused by stormwater runoff from significant early summer storm events and above average rainfall. Educate watershed residents on ways to reduce stormwater runoff from their properties utilizing DES' "Homeowner's Guide to Stormwater Management". Increase monitoring frequency to three times per summer to better assess seasonal and annual water quality trends.

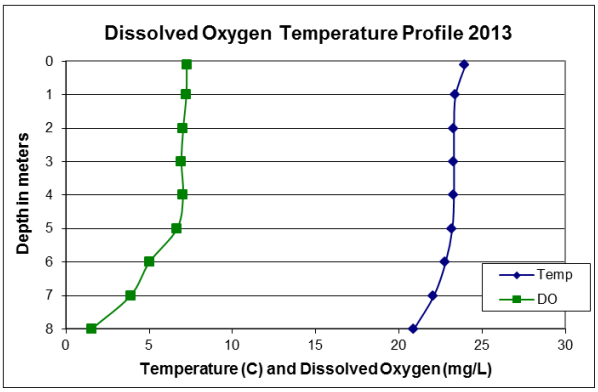


Table 1. 2013 Average Water Quality Data for JACKMAN RESERVOIR

Station Name	Alk.	Chlor-a	Chloride	Cond.	Total P	Trans.		Turb.	pH
	mg/l	ug/l	mg/l	uS/cm	ug/l	m		ntu	
						NVS	VS		
Epilimnion	2.30	7.51	3	29.3	10	1.90	2.73	0.95	6.13
Hypolimnion				29.4	10			0.99	6.00
North Branch			4	33.3	16			0.99	6.32

NH Median Values: Median values for specific parameters generated from historic lake monitoring data.
Alkalinity: 4.9 mg/L
Chlorophyll-a: 4.58 mg/m^3
Conductivity: 40.0 uS/cm
Chloride: 4 mg/L
Total Phosphorus: 12 ug/L
Transparency: 3.2 m
pH: 6.6

NH Water Quality Standards: Numeric criteria for specific parameters. Results exceeding criteria are considered a water quality violation.
Chloride: < 230 mg/L (chronic)
E. coli: > 88 cts/100 mL – public beach
E. coli: > 406 cts/100 mL – surface waters
Turbidity: > 10 NTU above natural level
pH: 6.5-8.0 (unless naturally occurring)

HISTORICAL WATER QUALITY TREND ANALYSIS

Parameter	Trend	Explanation	Parameter	Trend	Explanation
pH	N/A	Ten consecutive years of data necessary.	Chlorophyll-a	N/A	Ten consecutive years of data necessary.
Conductivity	N/A	Ten consecutive years of data necessary.	Transparency	N/A	Ten consecutive years of data necessary.
			Phosphorus (epilimnion)	N/A	Ten consecutive years of data necessary.